REMARKS / ARGUMENTS

Examiner Do is thanked for the thorough examination of the subject Patent Application. The claims have been carefully reviewed and amended, and are considered to be in condition for allowance.

It is the objective of this invention to provide a multichannel digital filter bank circuit and a method implemented by cascading sub-filters of the recursive type suitable for graphically equalizing electrical signals received via a communication path. It is also an objective of this invention to produced equalized signals having minimal distortion of signal spectral characteristics including magnitude and phase. The circuit of this invention is implemented with cascaded connections of first order or second order digital filters. It is an additional objective of this invention to provide for the programming of the individual transfer functions of the above digital filters so as to produce unity gain. This unity gain case results in an output signal which is an exact replica of the input signal with no delay. This result indicates the minimal distortion introduced by the method of this invention.

Reconsideration of the rejection of claims 1 and 4, under 35 U.S.C. 102(e) as being anticipated by Tan et al. (US Patent 6,233,594), is requested based on the following.

As per the examiner's suggestion in the Response to Arguments section of the June 23, 2006 office action, claims 1 and 4 have been amended to include the limitations

of the specification into the wording of the claims. In particular, claims 1 and 4 have been amended to specifically claim a graphics equalizer which utilizes multichannel digital filter bank. In addition, claims 1 and 4 have been amended to include the limitation that the digital filters of the instant application have programmable parameters which allow users to shape frequency spectra as desired. The amended claim 1 is shown below.

A graphics equalizer utilizing multichannel digital filter bank comprising:

a plurality of first order or second order digital filters, connected in a cascade fashion, whereby said electrical signals are enhanced, attenuated or kept the same, after passing through said cascading sub-filters, wherein said first order or second order digital filters are of the recursive type suitable for graphically equalizing electrical signals received via a communication path,
wherein said first or second order digital filters do not require multiple sampling frequencies, and
wherein said first and second order digital filters have programmable parameters which allow users to shape said graphics equalizer's frequency spectra as desired.

As per the examiner's comments in the June 23, 2006 office action, the above amendments to claims 1 and 4 now allow the following rebuttal to the 35 U.S.C. 102(e) rejection based on Tan et al (US 6,233,594). Tan et al, which is not a graphics equalizer, uses fixed low pass filter sections which block high frequencies. The instant application, which is a graphics equalizer, uses bandpass filter sections with programmable parameters which allow users to shape the frequency spectrum as required. Also, Tan et al. involves filters with multiple sampling frequencies. In Tan, the second sampling frequency is less than the first sampling frequency. Similarly, the third sampling frequency is less than the second sampling frequency. Claim 1 of Tan clearly states the requirement for two frequencies. Filters such as Tan which have reduced sampling frequency between

consecutive sections are known as decimation filters. The filter described in Tan et al. Is more complex than the instant application, as is shown in claim 1 as amended below where it is stated that the instant application does not require multiple sampling.

Reconsideration of the rejection of claims 2 and 5, under 35 U.S.C. 102(b) as being anticipated by Dyer (US Patent 4,947,360), is requested based on the following.

As per the examiner's comments in the June 23, 2006 office action, claims 1 and 4 have been amended to include the limitations of the specification into the wording of the claims. In particular, claims 1 and 4 have been amended to specifically claim a graphics equalizer which utilizes multichannel digital filter bank. In addition, claims 1 and 4 have been amended to include the limitation that the digital filters of the instant application have programmable parameters which allow users to shape frequency spectra as desired. These changes to independent claims 1 and 4 now allow the following rebuttal to the 35 U.S.C.102(b) rejection based on Dyer (US 4,947,360).

Figures 1 and 2 of Dyer show stages of sub-filter of a recursive filter. Dyer includes three different types of filters. These include sub-filters, all-pass filter, and T-section filter. Each have unique transform equations. The design of Dyer is much more complex than the claimed invention. Dyer uses a crisscross network with feedback from the output of "block 25" (fig.2) to the input at "block 31" and a feed forward from the output of "block 11" to "block 33". The instant application uses a simple straight-line cascade connection of subsections without any crisscross wires. Also, Dyer, which is not a graphics equalizer,

does not explicitly indicate that there is no additional delay of the inbound signal. The instant application, as is shown in amended claims 1 and 4 above, illustrates the simpler implementation utilizing one type of sub-filter of the recursive type instead of the three types of filters used in Dyer. In addition, dependent claims 2 and 5 should be allowed, since they follow from independent claims 1 and 4 respectively which should now be allowed based on the arguments of this office action reply.

Reconsideration of the rejection of claims 3 and 6, under 35 U.S.C. 102(b) as being anticipated by Cox et al. (US Patent 5,353,346), is requested based on the following.

As per the examiner's comments in the June 23, 2006 office action, claims 1 and 4 have been amended to include the limitations of the specification into the wording of the claims. In particular, claims 1 and 4 have been amended to specifically claim a graphics equalizer which utilizes multichannel digital filter bank. In addition, claims 1 and 4 have been amended to include the limitation that the digital filters of the instant application have programmable parameters which allow users to shape frequency spectra as desired. These changes to independent claims 1 and 4 now allow the following rebuttal to the 35 U.S.C.102(b) rejection based on Cox et al (US 5,353,346).

Cox et al. is primarily a signal classifier. Cox uses a series of notch filters to separate an inbound signal into separable components. Cox splits the input signal into two parallel paths (High-Band Isolation and Low-Band Isolation). The output of each of the parallel paths is further split into 3 parallel paths. Cox requires functional blocks such

as high-band isolation filter, low-band isolation filter, block classifier, and timing classifier. Cox uses fixed frequency blocks, and is limited by the additive results of a few constant amplitude sinusoidal components. Cox which is not a graphics equalizer does not teach the simple filtering techniques of the instant application. The instant application, as is shown in claim 1 as amended above, illustrates the simpler implementation utilizing one type of sub-filter of the recursive type instead of complex separation of the inbound signal using multiple notch filters used in Cox. In addition, claims 3 and 6 should be allowed, since they depend on independent claims 1 and 4 respectively, which should now be allowed based on the arguments of this office action reply.

We have reviewed the related art references made of record and agree with the Examiner that none of these suggest the present claimed invention.

The examiner is thanked for the thorough review of this patent application. The changes to the specification do not introduce any new matter.

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

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